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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,183	03/10/2004	Tomohiro Saito	04329.3265	2731

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EXAMINER

QUACH, TUAN N

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/796,183

Applicant(s)

SAITO, TOMOHIRO

Examiner

Tuan Quach

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 and 14-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

  
**Tuan Quach**  
**Primary Examiner**

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

Claims 9-13 are elected without traverse. Claims 1-8 and 14-20 are withdrawn from consideration.

The abstract of the disclosure is objected to because it only recites the process or method of fabrication and does not describe the elected product invention.

Correction is required. See MPEP § 608.01(b).

Claims 9-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "fin-type" in claim 2, various occurrences, e.g., line 2 et seq. is indefinite as what is meant or encompassed by "type" cannot be determined and does not appear to add anything to the phrase. The deletion of "type" would overcome this rejection.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9, 12, 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hu et al. (Hu).

Re claim 9, Hu (6,413,802 B1) teaches a semiconductor device comprising a silicon fin layer 14 on a silicon substrate 10, mask layer 16 on the silicon fin layer, gate insulating film (column 3 line 56) and gate 20 (column 4 lines 1-3) on the side surfaces

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of the fin silicon and the mask, first impurity regions (sour/drain, column 4 lines 20-31) apart from region under the gate, and second impurity regions, e.g., LDD, column 4 line 6, as well as angled and shallow implant region, e.g., column 4 line 26, between the first impurity regions and the region under the gate. See Fig. 2C-2F, column 3 line 3 to column 4 line 65. Re claim 12, gate material of metal is taught, column 3 line 63; alternative material of metal silicide is well known and is encompassed in material delineated, column 3 line 63 or otherwise would have been notoriously conventional and obvious. Alternatively, official notice is given regarding such conventional use.

Re claim 13, the impurity concentration of source/drain being higher than LDD would have been met or otherwise would have been obvious, as the light implant is implant for the LDD region; see also column 4 line 23-25.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10, 11, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu taken with Inaba et al. (Inaba).

Hu is applied as above and does not explicitly recite the width of the second impurity region with regard to the thickness of the mask in claim 10, and the relative concentrations in claims 11 and 13.

Hu however is not limited in the thickness of the mask material. Inaba 6,525,403 B2 further shows gate 14 on gate insulating 13 and mask 22 over source drain 17 and impurity regions 13, including showing of second impurity regions of lesser thickness. The relative concentrations of the impurity regions are also shown, e.g., Fig. 8-13, regions 13, 42, 43, 44, and 17. See column 7 line 56 to column 12 line 26, column 9 line 50-54.

It would have been obvious to one skilled in the art in practicing the above invention to have optimized the width of the impurity doped region including having its width less than the thickness of the mask material since such is conventional and advantageous as evidenced in Inaba above wherein regions in the channel region are minimized to reduce parasitic resistance. It would have been obvious and would have been within the purview of one skilled in the art to have selected and optimizing the appropriate relative dopant concentrations as corresponding to obvious possible alternatives and as evidenced by respective regions in Fig. 8-13 above and column 11 lines 44 to column 12 line 26 to obtain the desired applications.

Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inaba.

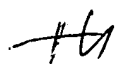
Re claims 9-13, Inaba 6,525,403 B2 shows gate 14 on gate insulating 13 and mask 22 over source drain 17 and impurity regions 13, including showing of second impurity regions of lesser thickness. The relative concentrations of the impurity regions are also shown, e.g., Fig. 8-13, regions 13, 42, 43, 44, and 17. See column 7 line 56 to column 12 line 26, column 9 line 50-54. Note that re claim 9, although Figs. 8-13 does not the fin silicon layer on a silicon substrate, the limitation regarding the fin layer on a silicon substrate would have been conventional and obvious given the teachings of Inaba Fig. 15A-17, column 13 to column 14 line 436, wherein fin layer 64A is formed and wherein bias to channel can be controlled. Regarding claim 10, it would have been obvious to have optimized the width of the impurity doped region including having its width less than the thickness of the mask material since such is conventional and advantageous as evidenced in Inaba above wherein regions in the channel region are minimized to reduce parasitic resistance. Re claims 11 and 13, it would have been obvious and would have been within the purview of one skilled in the art to have selected and optimizing the appropriate relative dopant concentrations as corresponding to obvious possible alternatives and as evidenced by respective regions in Fig. 8-13 above and column 11 lines 44 to column 12 line 26 to obtain the desired applications. The use of metal or metal silicide as gate material as in claim 12 is notoriously conventional and as such would have been obvious. Alternatively, official notice is given regarding such conventional use.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fired et al. 7,052,958 is made of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Tuan Quach whose telephone number is 571-272-1717. The examiner can normally be reached on M-F from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Nathan Flynn, can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**Tuan Quach**  
**Primary Examiner**